

GRADE 6 MATHEMATICS CURRICULUM SPECIFICATIONS

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GRADE 6 MATHEMATICS CURRICULUM SPECIFICATIONS

The Mathematics Curriculum Specifications for Grade 6 were prepared in September, 1982, by a committee of classroom teachers, consultants, and Alberta Education personnel under the direction of the Curriculum Branch. Alberta Education acknowledges with appreciation the contributions of the following members of the Grade 6 Mathematics Committee:

- A. Anderson, Alberta Education, Chairman
- G. Popowich, Alberta Education
- W. Lencucha, Alberta Education
- B. Bober, Edmonton Catholic School Board
- S. Shamchuk, Edmonton Public School Board
- E. Dach, County of Strathcona
- M. Johnson, Taber School Division
- G. Knauft, Peace River School Division
- M. Bye, Calgary Public School Board

The following considerations determined the final Curriculum Specifications for Grade 6:

1. The specifications were based on the *Program of Studies for Elementary Schools*, September, 1982.
2. The content emphasis to be placed on each of the four components that make up the elementary mathematics program is reflected in Table I on the following page.
3. The problem solving and psychomotor skills components are viewed as integrative within the subject matter dimension and should not be treated as separate entities. The relative emphasis of problem solving and psychomotor with each of the five subject matter (concept) strands is reflected in Table II.
4. The attitude component is viewed as being pervasive throughout the total program.
5. Table III denotes the relative emphasis to be placed on each of the subject matter statements within each of the five concept strands. The taxonomic levels (knowledge, comprehension, application) indicated suggest the cognitive domains to which the concept is to be developed and extended.
6. Three taxonomic classifications were suggested and defined by the committee:

Knowledge

- Testing for knowledge includes exercises involving immediate recall and routine manipulation. This level represents primarily the outcomes which require of the student no decision making or complex memory.

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Comprehension

- Knowledge of concepts. A concept is an abstraction and as such requires more complex decision making than that involving knowledge of specific facts.
- Translations. Comprehension involves translating from the concrete to pictorial to symbolic, or in reverse order.

Application

- includes the ability to solve problems involving learned skills and concepts.
- involves the ability to recognize patterns and relationships.

WEIGHTING FACTORS

Table 1 suggests the emphasis in percent that each program element area would receive in the program. The committee did not establish weightings for the three taxonomic levels as it was anticipated that choice of level for testing purposes will be based primarily on where an objective lies within the scope and sequence of the program. An introductory objective would normally require a knowledge item. A teaching or mastery objective, which has had some previous orientation in the program, could be tested by higher level test forms. Table III, therefore, presents the committee's choice of taxonomic levels for testing and the suggested cognitive level that the concept should be developed or expended to in instruction.

TABLE I - PROGRAM COMPONENT WEIGHTINGS

PROGRAM COMPONENTS:	WEIGHTINGS:
1. Subject Matter (concepts):	
Numeration	- 15%
Operations & Properties	- 25%
Measurement	- 5%
Geometry	- 10%
Graphing	- 5%
	60%
2. Problem Solving Skills	20%
3. Psychomotor Skills	10%
4. Attitudes	10%

TABLE II - INTEGRATION OF PROBLEM SOLVING AND PSYCHOMOTOR SKILLS IN THE SUBJECT MATTER COMPONENT

SUBJECT MATTER STRANDS	CONCEPTS	PROBLEM SOLVING APPLICATIONS *	PSYCHOMOTOR SKILLS APPLICATION
NUMERATION	15%	4%	
OPERATIONS & PROPERTIES	25%	4%	
MEASUREMENT	10%	4%	4%
GEOMETRY	5%	2%	5%
GRAPHING	5%	1%	1%

*The remaining 5% of the 20% weighting for the problem solving component is for the purpose of developing the problem solving model and strategies therein outside of the context of a mathematical application.

TABLE III

GRADE SIX

Numeration

1. Identifies and names place value to billions (0.0001 - 1 000 000 000).
2. Writes decimal numerals using expanded notation.
3. Rounds numbers (0.0001 to 999 999 999).
4. Identifies and uses proportional ratios.
5. Expresses halves, quarters and fifths as fractions or decimals.
6. Expresses fractions and decimals as percents and vice versa.
7. Identifies and orders integers.
8. Reads, writes and orders whole numbers and decimals (0.0001 - 1 000 000 000).

TOTAL

Operations and Properties

1. Adds and subtracts whole numbers and decimals. Estimates sums and differences.
2. Demonstrates mastery of basic facts. Separate timed test.
3. Multiplies whole numbers and decimals using one, two and three-digit multipliers. Estimates products.
4. Divides whole numbers and decimals using one, two and three-digit whole number divisors.
5. Divides whole numbers and decimals using one decimal place divisors.
6. Checks multiplication by division and division by multiplication.
7. Mentally computes simple addition, subtraction, multiplication and division.
8. Calculates averages and percentages.

TOTAL

Measurement

1. Finds perimeter of polygons with and without formulas.
2. Finds area of triangles and rectangles using formulas.

	Concept Emphases in %	Knowledge	Comprehension	Application	Problem Solving	Psychomotor	Total in %
1.	3	✓					
2.	1	✓					
3.	2	✓	✓				
4.	2	✓	✓	✓	2		
5.	2	✓	✓				
6.	2	✓	✓	✓	1		
7.	1	✓	✓				
8.	2	✓	✓	✓	1		
TOTAL	15				4		19
1.	4	✓	✓	✓	1		
2.	5	✓					
3.	4	✓	✓	✓	1		
4.	4	✓	✓	✓	1		
5.	3	✓	✓				
6.	1	✓					
7.	1	✓	✓				
8.	3	✓	✓	✓	1		
TOTAL	25				4		29
1.	1		✓	✓	1	1	
2.	1		✓	✓	1		

	Concept Emphasis in %	Knowledge	Comprehension	Application	Problem Solving	Psychomotor	Total in %
3. Finds volume of rectangular solids using formulas.	1		/	/	1		
4. Reads and determines distances according to a scale.	1		/	/	1		
5. Draws diagrams according to a scale.	0	/	/	/		2	1
6. Reads the 24-hour clock and writes corresponding time notation	1	/					
7. Understands and uses the system of metric prefixes including use of symbols: kilo, hecto, deca, BASIC UNITS, deci, centi, milli.	2	/	/	/			
8. Expresses equivalent measures within units of length, capacity, mass and time with symbols.	2	/	/				
9. Measures angles.	1	/	/			1	
TOTAL	10				4	4	18
<u>Geometry</u>							
1. Constructs and draws prisms, pyramids, cones and cylinders.	1	/	/	/		2	
2. Draws and identifies radius, diameter and circumference.	0	/	/			1	
3. Translates, rotates, reflects, and enlarges 2-dimensional figures.	1	/	/	/	1	1	
4. Identifies and tests congruency using translations (slides), reflections (flips) and rotations (turns).	1	/	/	/	1	1	
5. Names corresponding sides, vertices, angles of congruent polygons.	1	/	/				
6. Identifies and names intersecting lines, parallel lines, perpendicular lines and angles.	1	/					
TOTAL	5				2	5	12
<u>Graphing</u>							
1. Constructs pictographs, bar and line graphs.	1		/	/		1	
2. Interprets and solves problems using pictographs, bar, line and circle graphs.	1		/	/	1		
3. Locates points in all four quadrants.	1		/				
4. Generates and graphs ordered pairs from a given relationship (no negative numbers).	2	/	/	/			
TOTAL	5				1	1	7

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